

Serial No. 10/043,167  
Amdt. dated January 28, 2004  
Reply to Office Action October 28, 2003

Docket No. P-0330

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A suction head ~~of~~ for a vacuum cleaner with a power brush, comprising:

a head case connected with to a cleaner body by via a connecting tube and having a suction hole ~~on~~ in a lower surface thereof;

a power brush positioned in the head case and protruded toward the outside of externally protruding from the head case through the suction hole thus ~~to be abutted to a~~ so as to allow contact with an object to be cleaned;

a supporting means fixed in the head case ~~[,]~~ for supporting the power brush to be capable of performing to allow rotary and linear movements of the power brush;

a rotary operating means installed within the power brush between the supporting means and the power brush ~~in the power brush~~, for rotary rotatively operating the power brush; and

a linear operating means installed positioned between the supporting means and the power brush ~~in the power brush~~, for moving horizontally reciprocating the power brush linearly along the supporting means.

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2. (Currently Amended) The suction head of claim 1, wherein the power brush is formed in the cylindrical in shape and has a brush plurality of bristles which are formed on a circumferential surface thereof for contacting with the object to be cleaned is abutted to the cleaning object on the outer circumferential surface.

3. (Currently Amended) The suction head of claim 2, wherein the brush is plurality of bristles are arranged in a spiral shape on the circumferential surface of the power brush.

4. (Currently Amended) The suction head of claim 1, wherein the supporting means comprises:

a supporting shaft having both ends with each end fixed on the to and inner wall of the head case, the supporting shaft receiving and supporting under the condition that the supporting means protrudes the power brush thereon;

a linear moving guide means positioned between the supporting shaft and the power brush [,] for guiding linear movement of the power brush to move linearly along the supporting shaft; and

a bearing installed between the linear moving guiding means and the power brush; for rotating to facilitate rotation of the power brush relative the linear moving guide means.

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5. (Currently Amended) The suction head of claim 4, wherein the linear moving guide means is a guide bush fixed with to the supporting shaft, the guide brush due to having a cylindrical shape and combined being in contact with an inner race of the bearing in the a serration structure to mutually lock each other in the rotary direction.

6. (Currently Amended) The suction head of claim 5, wherein the guide bush has a stopper at both end portions thereof to restrict linear movement of the power brush at the both end portions.

7. (Currently Amended) The suction head of claim 5, wherein the guide bush has a hole where for passing an electric cable passes so that a therethrough which supplies electric power source can be supplied to the rotary operating means and the linear operating means.

8. (Currently Amended) The suction head of claim 1, wherein the rotary operating means is a rotary type motor comprising a stator fixed to the supporting means and a rotor fixed on the an inner circumferential surface of the power brush.

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9. (Currently Amended) The suction head of claim 1, wherein the linear operating means comprises:

a solenoid coil fixed to the supporting means [[,]] for generating electromagnetic flux;

a moving core fixed to ~~the~~ an inner circumferential surface of the power brush [[,]] for generating a linear moving force by in accordance with the electromagnetic flux generated by the solenoid coil; and

~~an~~ elastic means supported in the head case, for generating an ~~opposed~~ elastic force ~~to that opposes~~ a force generated between the solenoid coil and the moving core.

10. (Currently Amended) The suction head of claim 9, wherein the elastic means is installed between ~~the~~ both side surfaces of the power brush and ~~the~~ both inner wall surfaces of the head case, respectively, and provides ~~an~~ the elastic force to the power brush so that the power brush performs linear fluctuating reciprocating movement in the longitudinal direction along the supporting shaft.

11. (Cancelled)

12. (Cancelled)

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13. (Currently Amended) A suction head ~~of~~ for a vacuum cleaner with a power brush, comprising:

a head case connected with to a cleaner body by via a connecting tube and having a suction hole ~~on~~ in a lower surface thereof;

a power brush positioned in the head case and protruded toward the outside of formed externally protruding from the head case through the suction hole thus to be abutted to a cleaning object so as to allow contact with an object to be cleaned;

a supporting means fixed in the head case, for supporting the power brush to be capable of performing and allowing linear movements movement of the power brush; and

a linear operating means installed within the power brush between the supporting means and outer portions of the power brush in the power brush, for moving the power brush linearly in a linear direction.

14. (Currently Amended) The suction head of claim 13, wherein the linear operating means comprises:

a solenoid coil fixed to the supporting means [[,]] for generating electromagnetic flux;

a moving core fixed to ~~the an~~ inner circumferential surface of the power brush [[,]] for generating a linear moving force by in accordance with the electromagnetic flux generated by the solenoid coil; and

~~an~~ elastic means supported in the head case [[,]] for providing an elastic force to the power brush so that the power brush performs linear fluctuating reciprocating movement in the longitudinal direction.

15. (New) A suction head, comprising:
  - a power brush;
  - a case configured to receive the power brush;
  - a support mechanism configured to be fixed in the case and to allow for both rotary and linear movement of the power brush;
  - a power brush system provided within the power brush and configured to provide both the rotary and linear movement of the power brush; and
  - a suction hole formed in the case and configured to exert a suction force generated by an external source therethrough.

16. (New) The suction head of claim 15, wherein a portion of the power brush is configured to protrude through the suction hole.

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17. (New) The suction head of claim 16, wherein the power brush system comprises:
  - a rotary operating device provided between the support mechanism and the power brush and configured to rotate the power brush about a central axis; and
  - a linear operating device provided between the support mechanism and the power brush and configured to move the power brush in a linear direction along the central axis.
18. (New) The suction head of claim 16, wherein the support mechanism comprises:
  - a support shaft, wherein each end of the support shaft is fixed to a respective inner wall of the case, and wherein the support shaft is configured to extend through a central portion of the power brush;
  - a linear guide positioned between the support shaft and the power brush and configured to guide the linear movement of the power brush along the support shaft; and
  - a bearing installed between the linear guide and the power brush and configured to facilitate rotation of the power brush relative to the linear guide.
19. (New) The suction head of claim 16, wherein the rotary operating device comprises a rotary motor, the rotary motor comprising a rotor provided on an inner circumferential surface of the power brush and a stator fixed to the support mechanism.

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20. (New) The suction head of claim 16, wherein the linear operating device comprises:

a solenoid fixed to the support mechanism and configured to generate an electromagnetic flux;

a moving core fixed to an inner circumferential surface of the power brush and configured to generate a linear force based on the electromagnetic flux generated by the solenoid; and

an elastic device provided in the case and configured to generate an elastic force in opposition to the linear force generated by the moving core.

21. (New) The suction head of claim 16, wherein the power brush is configured to move in a rotary and linear direction simultaneously when both the rotary operating device and the linear operating device are engaged.

22. (New) The suction head of claim 16, wherein the linear movement of the power brush along the central axis comprises a reciprocal linear movement.